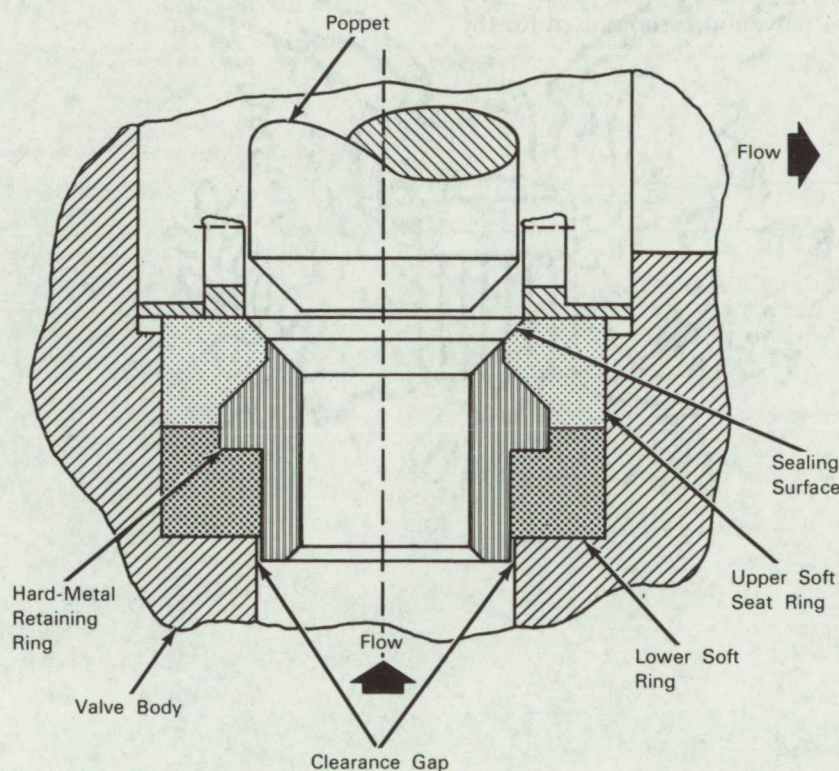


NASA TECH BRIEF



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Improved Poppet Valve Provides Positive Damageproof Seal



The problem: To design a soft-seat poppet valve that will provide positive closure against fluid without damage to the seating surface on repeated cycling.

The solution: A poppet valve incorporating two compressible soft rings and a retaining ring of hard metal. Sealing is effected when the poppet seat is forced into intimate contact with a mating surface on one of the soft rings.

How it's done: The upper soft ring provides the sealing surface for the valve poppet. Fluid pressure entering the clearance gap between the hard-metal retaining ring and the valve wall at the lower soft ring compresses the latter against the upper soft ring. When the valve is closed, the force exerted by the poppet against the sealing surface compresses the two soft rings, thus ensuring a positive leakproof seal.

(continued overleaf)

Damage to the sealing surface of the upper soft ring is prevented because the force applied to the poppet is distributed between the upper and lower rings. The retaining ring not only confines the two soft rings against the poppet compressive force but also protects the soft sealing surface of the upper ring from the erosive action of the high fluid velocities which occur when the valve is partially open.

Notes:

1. This valve provides an effective seal without requiring the application of large closing forces or expensive machining operations on the seating surfaces used in metal-to-metal valves.
2. Pneumatic valves of this type using soft rings made of polyamides and other plastic materials have performed satisfactorily. Higher wear resistance can be achieved by making the upper seat ring from a material (e.g., a polyamide) that is harder than the material (e.g., a polyfluorocarbon) used for the lower ring.

3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B65-10346

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(M-FS-293)